ASSIGNMENT 7

Textbook Assignment: "Brakes" (continued) and "Automotive Chassis and Body," chapters 7 and 8, pages 7-40 through 8-29.

- 7-1. What valve has the same type of mounting as the quick-release valve?
 - 1. Safety
 - 2. Tractor protecting
 - 3. Relay emergency
 - 4. Combined limiting and quick release
- 7-2. What valve functions as a set of remotely controlled cutout valves for normal and emergency air brake operations?
 - 1. Relay
 - 2. Tractor protection
 - 3. Relay emergency
 - 4. Safety
- 7-3. Of the following functions, which one is NOT a function of the relay emergency valve in an air brake system?
 - 1. To speed up the application of the trailer brakes
 - 2. To speed up the release of the trailer brakes
 - 3. To apply the trailer brakes when the emergency line of the trailer is broken
 - 4. To protect the tractor air brake system under trailer breakaway conditions

- 7-4. What is the function of the relay emergency valve during normal operation of a tractor-trailer unit?
 - 1. To protect the tractor air brake system under conditions of when severe leakage develops in the tractor or trailer
 - 2. To increase the air pressure in a designated area to speed up the application and release of the trailer brakes
 - 3. To synchronize trailer service brake air pressure and tractor service air brake pressure during treadle valve operation
 - 4. To control the air pressure that is delivered to the brake chambers of the trailer
- 7-5. If the brakes engage when the emergency line is removed from a charged trailer system, the relay emergency valve is functioning properly.
 - 1. True
 - 2. False
- 7-6. What is the function of the dummy couplings?
 - 1. To allow air to leave a unit while preventing dirt from entering
 - 2. To prevent dirt and moisture from entering unused air lines
 - 3. To increase air pressure to speed up application and release of the trailer brakes
 - 4.To conserve air pressure

- 7-7. Anytime the air pressure is within the normal operating range, the low-pressure warning indicator will
 - 1. remain open
 - 2. remain closed
 - 3. open and close intermittently
 - 4. begin to flash and buzz
- 7-8. The contacts on an air brake system stoplight switch will close when subjected to a minimum air pressure of
 - 1. 5 psi
 - 2. 10 psi
 - 3. 15 psi
 - 4. 20 psi
- 7-9. To test for leakage of various components within the air brake system, you should use
 - 1. water
 - 2. a very light-weight oil
 - 3. a thick mixture of soapsuds
 - 4. any water-free liquid
- 7-10. The air-hydraulic-power cylinder (Air-Pak) is composed of which of the following components?
 - 1. Master cylinder, compressed air cylinder, and slave cylinder
 - 2. Slave cylinder, control valve, and master cylinder
 - 3. Control valve, compressed air cylinder, and slave cylinder
 - 4. Compressed air cylinder, control valve, and master cylinder

- 7-11. What component of the Air-Pak houses the residual check valve?
 - 1. Control valve
 - 2. Master cylinder
 - 3. Slave cylinder
 - 4. Compressed air cylinder
- 7-12. Forward movement of the piston in the compressed air cylinder is dependent upon
 - 1. brake pedal pressure
 - 2. hydraulic pressure
 - 3. spring pressure
 - 4. air pressure
- 7-13. In an air-over-hydraulic brake system, fluid pressure in the brake lines is always in direct ratio to the
 - 1. amount of air pressure entering the compressed air cylinder
 - 2. resultant hydraulic pressure admitted to the air cylinder
 - 3. pressure forcing the power piston forward
 - 4. foot pressure on the brake pedal
- 7-14. In an air-over-hydraulic brake system, the degree of brake application is determined by the amount of compressed air trapped in the power cylinder when brake pedal movement is stopped.
 - 1. True
 - 2. False

- 7-15. When the brake pedal is released, what force returns the power piston to the released position?
 - 1. Air
 - 2. Spring
 - 3. Hydraulic
 - 4. Air-over-hydraulic
- 7-16. Which of the following requirements is NOT satisfied by the components of the vehicle chassis?
 - 1. Support the vehicle and its payload
 - 2. Provide for directional control
 - 3. Allow smooth operation over rough terrain
 - 4. Enclose the mechanical components and passenger compartment
- 7-17. What is the function of the cross members in a frame assembly?
 - 1. To reduce vibration
 - 2. To add extra strength at the joints
 - 3. To prevent weaving and twisting of the frame
 - 4. To support the payload of the vehicle
- 7-18. In a typical passenger vehicle, the frame supplies 37 percent of the torsional rigidity and 34 percent of the bending rigidity with the balance supplied by the body.
 - 1. True
 - 2. False

- 7-19. The side members of many passenger vehicle frames are closer together in the front than in the rear in order to
 - 1. supply more rigid support for the engine
 - 2. allow the vehicle to make sharper turns
 - 3. supply a more rigid support for the front wheels
 - 4. reduce vibration from the engine
- 7-20. What type of frame construction allows an increase in the amount of noise transmitted into the passenger compartment?
 - 1. Ladder
 - 2. Integrated
 - 3. Separated
 - 4. Jack
- 7-21. The suspension system of a vehicle is NOT designed to
 - 1. support the weight of the vehicle
 - 2. allow the vehicle to be driven with varying loads
 - 3. allow the vehicle to travel over various type of terrain
 - 4. allow body squat when accelerating with a heavy load
- 7-22. What component of the suspension system prevents the control arm from swinging to the front or rear of the vehicle?
 - 1. Control arm bushings
 - 2. Strut rod
 - 3. Stabilizer bar
 - 4. Strut

- 7-23. The control arm of a vehicle has bushings on the inner end. What suspension component is attached to the outer end?
 - 1. Shock absorber
 - 2. Strut
 - 3. Ball joint
 - 4. Stabilizer bar
- 7-24. What movement allows the steering knuckle and wheel to be turned left or right and move up and down with changes in road surface?
 - 1. Compression and rebound of the shock absorber
 - 2. Swiveling action of the ball joints
 - 3. Lateral movement of the control arms
 - 4. Horizontal movement of the strut rods
- 7-25. In a vehicle equipped with MacPherson struts, the strut assembly replaces the
 - 1. upper control arm
 - 2. lower control arm
 - 3. upper damper unit
 - 4. steering knuckle
- 7-26. In a vehicle equipped with MacPherson struts, what components are required to support the front-wheel assembly?
 - 1. Strut assembly and lower control arm
 - 2. Steering knuckle and upper damper unit
 - 3. Strut assembly and upper damper unit
 - 4. Steering knuckle and lower control arm

- 7-27. What term refers to the stiffness or tension of a spring?
 - 1. Elastic tolerance
 - 2. Spring ratio
 - 3. Elastic deformation
 - 4. Spring rate
- 7-28. Which of the following components do NOT add to the unsprung weight of a vehicle?
 - 1. Wheels
 - 2. Axles
 - 3. Rims
 - 4. Body
- 7-29. As a vehicle goes over a bump, its multileaf springs are held together by the
 - 1. spring shackles
 - 2. rebound clips
 - 3. bumper blocks
 - 4. clip plates
- 7-30. What is the purpose of an auxiliary spring?
 - 1. To offset the effect of a weak main spring
 - 2. To prevent braking of the main spring
 - 3. To eliminate the danger of overloading
 - 4. To provide additional support for heavy loads

- 7-31. What component in a bogie suspension system distributes the rear load evenly to the axles?
 - 1. Cross shaft
 - 2. Trunnion axle
 - 3. Springs
 - 4. Torque rods
- 7-32. What suspension component when worn will make a clunking or popping sound when the vehicle is turning or driving over a bump?
 - 1. Ball joint
 - 2. Strut rod
 - 3. Control arm
 - 4. Torsion bar
- 7-33. What tool is used to measure the axial play of a ball joint?
 - 1. Spring gauge
 - 2. Micrometer
 - 3. Dial indicator
 - 4. Outside caliper
- 7-34. A loose shock absorber will produce what type of sound?
 - 1. Loud popping
 - 2. Loud banging
 - 3. Loud snapping
 - 4. Loud clunking

- 7-35. In general, a good shock absorber should stop movement in two to three rebounds.
 - 1. True
 - 2. False
- 7-36. What action should be taken when you notice a damaged shock absorber on the rear of the vehicle?
 - 1. Replace the damaged shock absorber
 - 2. Replace all shock absorbers on the vehicle
 - 3. Replace both rear shock absorbers
 - 4. Install a helper spring to aid the damaged shock absorber
- 7-37. What condition lowers the height of the vehicle, allowing the body to settle towards the axles?
 - 1. Faulty struts
 - 2. Spring fatigue
 - 3. Weak shock absorbers
 - 4. Worn control arm bushings
- 7-38. What measurement is used to check the condition of the springs?
 - 1. Vehicle height
 - 2. Spring height
 - 3. Curb height
 - 4. Body height

- 7-39. What two factors are used to determine steering ratio?
 - 1. Steering linkage ratio and steering mechanism gear ratio
 - 2. Turning ratio and steering linkage ratio
 - 3. Steering mechanism gear ratio and diameter of the pinion gear
 - 4. Diameter of the worm gear and diameter of the pinion gear
- 7-40. Of the following systems, which one is NOT a type of manual steering?
 - 1. Cam and lever
 - 2. Rack and pinion
 - 3. Sector and lever
 - 4. Worm and nut
- 7-41. In a worm and sector steering gear, the pitman arm carries the sector gear and the worm gear is carried on the steering gear shaft.
 - 1. True
 - 2. False
- 7-42. The design of the worm and roller steering gear provides a
 - 1. high steering ratio
 - 2. low steering ratio
 - 3. medium steering ratio
 - 4. variable steering ratio

- 7-43. What action within a cam and lever steering gear causes the lever and pitman arm to rotate?
 - 1. The rotation of the camshaft
 - 2. The angle of the lever in relation to the cam
 - 3. The movement of the studs on the cam
 - 4. The cam screwing up and down on the camshaft
- 7-44. What is the most common type of worm and nut steering gear?
 - 1. Rolling ball
 - 2. Rotating ball
 - 3. Recirculating ball
 - 4. Reducing ball
- 7-45. In a manual rack-and-pinion steering gear, what component preloads the rack-and-pinion gear teeth to prevent excessive backlash?
 - 1. Thrust plate
 - 2. Thrust spring
 - 3. Thrust washer
 - 4. Thrust bearing
- 7-46. In a rack-and-pinion steering gear, the rack is connected to the steering arm by what steering linkage component?
 - 1. Strut rod
 - 2. Tie rods
 - 3. Center link
 - 4. Idler arms

- 7-47. The oil flow with a power steering system is directed by the
 - 1. hydraulic pump
 - 2. power cylinder
 - 3. control valve
 - 4. hydraulic gear housing
- 7-48. What are the three types of power steering systems?
 - 1. Internal rotor, external spool, and rack and pinion
 - 2. Internal spool, external slipper, and rack and pinion
 - 3. Integral cylinder, external piston, and rack and pinion
 - 4. Integral piston, external cylinder, and rack and pinion
- 7-49. What is the most common type of power steering system?
 - 1. Integral piston
 - 2. Integral cylinder
 - 3. Internal spool
 - 4. Internal rotor
- 7-50. With the steering wheel in the straight-ahead position, what valve in the integral power steering system balances hydraulic pressure on both sides of the power piston?
 - 1. Relief
 - 2. Flow
 - 3. Shuttle
 - 4. Control

- 7-51. The spool type control valve used in a power rack-and-pinion steering system is operated by the
 - 1. torsion bar connected to the pinion gear
 - 2. thrust action of the pinion shaft
 - 3. hydraulic piston attached to the center of the rack
 - 4. power cylinder connected to the rack
- 7-52. In a power rack-and-pinion steering system, what action moves the rotary type control valve to align specific oil passages?
 - 1. Twisting of the torsion bar
 - 2. Thrusting of the pinion shaft
 - 3. Movement of the power cylinder
 - 4. Oil pressure acting on the power piston
- 7-53. When you check an idler arm for wear, as a general rule the idler arm should NOT move up and down more than
 - 1. 1/8 inch
 - 2. 1/2 inch
 - 3. 1/3 inch
 - 4. 1/4 inch
- 7-54. When replacing tie-rod ends, you should take what action once the tie rod has been removed from the steering knuckle?
 - 1. Measure steering knuckle length
 - 2. Measure tie-rod length
 - 3. Measure curb height
 - 4. Measure front-end alignment

- 7-55. What are the two basic adjustments that may be made on a manual steering gearbox?
 - 1. Over-center clearance and worm bearing preload
 - 2. Sector bearing preload and pinion clearance
 - 3. Pinion shaft preload and worm shaft clearance
 - 4. Cam clearance and lever bearing preload
- 7-56. When adjusting a manual steering gearbox, you should first adjust the over-center clearance and then the worm bearing preload.
 - 1. True
 - 2. False
- 7-57. When adjusting the worm bearing preload, you should use what tool to measure the amount of force required to turn the steering wheel to the center position?
 - 1. Centering gauge
 - 2. Pressure scale
 - 3. Spring scale
 - 4. Wheel measuring gauge
- 7-58. You should take what action if the steering wheel binds after you have performed a worm bearing preload adjustment on a manual steering gearbox?
 - 1. Readjust the worm bearing preload
 - 2. Continue with the over-center clearance adjustment
 - 3. Replace the gearbox
 - 4. Loosen the worm bearing locknut

- 7-59. To find the center position of a steering wheel, turn the steering wheel from full right to full left wile counting the turns and divide by two.
 - 1. True
 - 2. False
- 7-60. The rack guide adjustment screw in a rack-and-pinion steering system is adjusted when there is
 - 1. no play in the steering
 - 2. excessive play in the control valve
 - 3. no play in the power cylinder
 - 4. excessive play in the steering
- 7-61. Which of the following power steering system services will you NOT routinely perform?
 - 1. Check fluid level
 - 2. Check belts
 - 3. Check for leaks
 - 4. Pressure test hoses
- 7-62. When you perform a pressure test on a power steering system, the shut-off valve should NOT be closed for more than
 - 1. 5 seconds
 - 2. 10 seconds
 - 3. 15 seconds
 - 4. 20 seconds
- 7-63. Of the following problems, which one is NOT common to the steering system?
 - 1. Hard steering
 - 2. Steering wheel play
 - 3. Steering wheel vibration
 - 4. Abnormal sounds when turning

- 7-64. You should NOT be able to turn the steering wheel more than 1 1/2 inches without causing the front wheels to move.
 - 1. True
 - 2. False
- 7-65. Which of the following steering problems may be caused by improper frame alignment?
 - 1. Excessive steering wheel play
 - 2. Abnormal noises when turning
 - 3. Hard steering
 - 4. Steering wheel vibration